egnite

Querx TH

Web thermometer / hygrometer and data logger

User Guide

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1 Introduction

Querx TH is a networking enabled measuring unit for collecting temperature and humidity values.

This manual contains the basic information needed for setting up, operating and maintaining Querx TH.

Querx TH online

Up-to-date and in-depth information on Querx TH can be found on the websites http://www.egnite.de and http://sensors.egnite.de.

1.1 Safety instructions

Please read this manual carefully and obey the following safety instructions to minimize risks of injury and damage.

Intended purpose

Querx TH is used for stationary measurement and processing of temperature and humidity data, as well as for providing this data over several interfaces.

All other use is regarded as not according to the intended purpose. egnite can not be held responsible for consequences from unintended use.

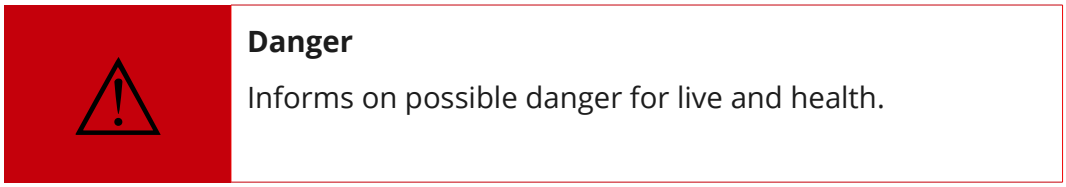
Danger of death caused by electrical shocks

To avoid accidents caused by electrical current, please obey the following instructions:

- Only use device, cable and adapter in proper condition.
- Disconnect power supply during maintenance.
- Do not manipulate the device or its accessories.
- Repairs are only to be done by trained staff.
- Don't submerge the device in water or other liquids.

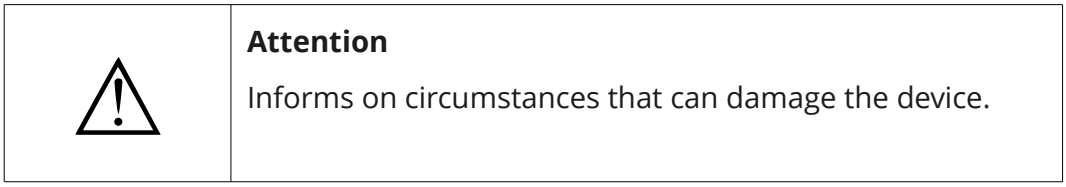
Symbol explanation

In this manual the following symbols are used:



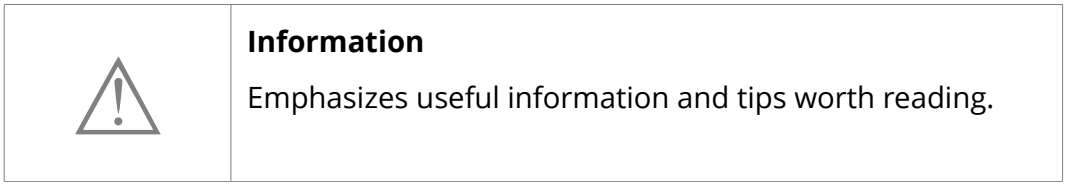
Danger

Informs on possible danger for live and health.



Attention

Informs on circumstances that can damage the device.



Information

Emphasizes useful information and tips worth reading.

1.2 About Querx TH

Querx TH measures temperature, humidity and calculates the dew point. The alert function sends out notifications over email (TLS / StartTLS), SNMP trap and syslog, if critical thresholds are exceeded.

The internal memory stores at least 51 days of data. An interactive web interface provides a graphical representation of the logged data and the possibility to export it in the CSV and XML file formats.

Cloud interfaces connect Querx TH to the Internet of Things and allow world wide data access via web and Android App.

Through SNMP, you connect Querx TH to network management systems, such as Nagios or Zabbix. Modbus/TCP allows usage in industrial environments (SCADA).

1.2.1 Querx PT100 at a glance

(1) Button for configuration reset

(2) Status LED

(3) Micro-USB jack for power supply

(4) Sensor cable with humidity and temperature sensors

(5) RJ-45 jack for Ethernet connection

(6) Link LED

1.2.2 Features

- Integrated high-quality sensors: oil-repellent, water- and dust-proof
- Measuring range temperature: -40°C – 85°C
- Measuring range humidity: 0-95% rH
- Alerts via email, SNMP trap and syslog message
- Automatic network configuration via DHCP, mDNS and Bonjour
- Ten alarm types:
    - Temperature too high / low
    - Temperature too low / low
    - Temperature rises /drops too fast
    - Humidity rises / drops too fast
    - Dew point too high / too low

- Secured email transmission with TLS / StartTLS
- M2M-Communication: SNMP and Modbus/TCP
- Cloud export: world wide data access and programming interfaces
- Interactive web interface with graphical depiction of recorded data
- Android App available
- Data logger with internal memory for at least 51 days
- CSV and XML data export

1.2.3 Possible fields of application

- Server room monitoring
- Estate monitoring
- Automated climate profiling for buildings
- Preventive conservation
- Cause-determination for mold-remediation

1.2.4 Included in delivery

Querx TH Set (Article EGN600114))

- Querx TH with sensors for temperature and humidity
- Ethernet cable
- Micro-USB cable
- USB wall plug adapter with clippings for UK, EU, US and AU
- CD with software and documentation

Querx TH (Article EGN600214)

- Querx TH without accessories

2 Putting into operation

2.1 Network connection

1. Connect Querx TH to your network, using the supplied network cable. If no DHCP server is available in your network, you can directly connect Querx TH to the computer, which is used for configuration.

2.2 Power supply

1. Prepare the wall plug adapter by gently pushing the clipping for your country into the guide rails from above, until it locks in place.

2. Now connect the wall plug adapter to the device, using the provided Micro-USB cable.
3. Put the adapter into the wall outlet. Querx TH's status LED lights yellow.

Danger

Never use the device with a broken adapter. There is a risk for live caused by electrical current.

If you do not have a free wall outlet, you can directly connect Querx TH to any free USB port at your computer.

2.3 Network configuration with DHCP

Over DHCP, Querx TH can obtain an automatic network configuration. If valid settings are received, the status LED lights green.

If a network error has occurred, Querx TH blinks yellow. In this case, check whether the network cable is connected properly. If the problems remain, ask your network administrator for advice.

2.4 Manual network configuration

If your network does not support DHCP and your computer does not support mDNS, you have to manually carry out the network configuration.

Information

Most users won't need the following instructions. Please continue with chapter 4, 'Accessing the web interface'.

2.4.1 Installation of Device Discoverer

On the supplied CD-ROM you will find the application **Device Discoverer**, which allows remote configuration of Querx TH.

1. Start the installation software for **Device Discoverer**.
2. Follow the instructions within the installation wizard.

2.4.2 Assign network configuration

1. Start the application **Device Discoverer.**
2. Right-click on the device, which you want to configure and choose *Device configuration*.
3. Enter an *IP address* and a *network mask.*
4. Click the *OK* button.

Querx TH will restart with the new configuration. The status LED lights yellow. As soon as the device is available, the status LED blinks green.

2.5 Basic configuration

Now, Querx TH is configured for network access. Please continue with chapter 3 'Accessing the web interface' and

afterward carry out the basic configuration as discussed in chapter 4 'Configuration'.

3 Accessing the web interface

3.1 Host name

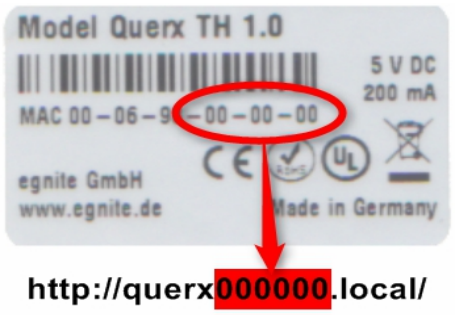
Access via host name

With mDNS, you can directly access Querx TH over its system name in the local network. This name can be configured in the configuration interface.

1. Open a web browser and enter the following URL in the address bar:

   http://<*systemname*>.local/

   Per default, this system name is querx00000, where you have to replace the six 0s with the last six characters of the device's MAC address. This address can be found on the sticker at the bottom side of the unit.



   For the example image above, the address is:

   http://querx000000.local/

Access via Bonjour

From the Safari web browser, you can also access Querx TH directly over the Bonjour menu.

⚠	**Information** If you cannot access the web interface, you need to manually set a network configuration. How to do this is discussed in chapter 2.5 'Manual network configuration'.

3.2 Homepage

On Querx TH's homepage you will find the recorded data displayed in an interactive chart. In chapter 5 'Data access and configuration of interfaces' you will learn how to use the display and export functions.

In the upper part of the homepage, you find buttons to log in at Querx TH and to open the configuration interface.

3.3 Log in

If you have configured users and assigned access rights to them, you need to log in at Querx TH. Enter your user name in the field *User,* your password in the field *Password* and click *Login* afterward.

In Querx TH's default configuration, no users are configured. You can learn more on user management in chapter 4.3 'User Management'.

3.4 Accessing the configuration interface

To access the configuration interface, click on the *Configuration* button in the upper right corner of the homepage.

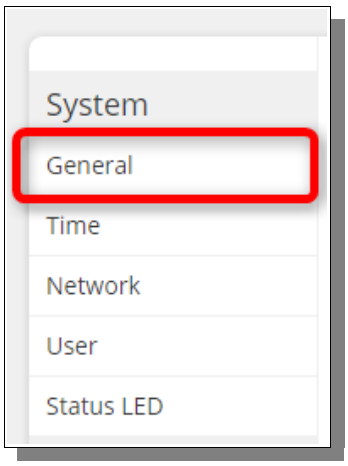
4 Configuration

4.1 Basic configuration

For proper operation, the following configuration steps need to be carried out.

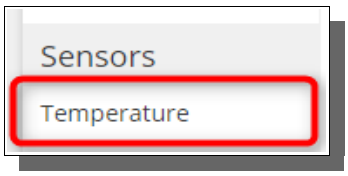
4.1.1 Assign system name

On the homepage of the configuration interface, which can also be accessed via *System / General*, enter a system name for the device. This name is used to identify the unit and for addressing it in your network.



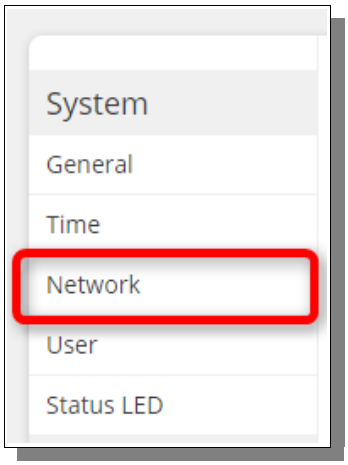
1. Enter the system name in *System name*.
2. If you want to use SNMP, enter a responsible member of staff in *Contact person* and the location of the device in *System location*.
3. Click on *Save* to apply your changes.

4.1.2 Configuration of the temperature unit



1. In the configuration interface, click on *Sensors / Temperature.*
2. Choose the physical temperature unit for Querx TH to work with from the field *Unit*.
3. Click on *Save* to apply your changes.

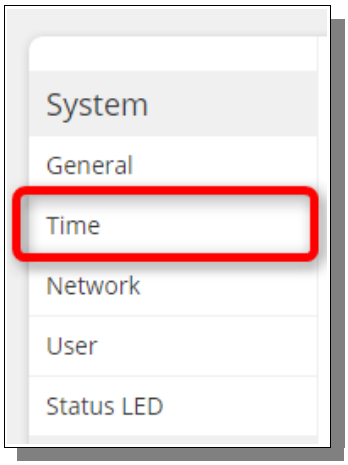
4.1.3 Configure a name server



You need to provide a name server to enable services like NTP, email and cloud connectivity.

1. In the configuration interface, click on *System / Network*.
   a. If a name server is provided via DHCP, check *Obtain DNS server automatically.*
   b. To manually set a name server, select *Set DNS server manually* and enter the IP address at *Preferred DNS server.*
2. Click on *Save* to apply your changes.
3. If you have changed DNS settings, restart the unit over web interface, as discussed in chapter 6.1.

4.1.4 Set date and time



There are three ways to set date and time:

If there is an NTP server available in your local network or if Querx TH has an internet connection, you should obtain date and time automatically via SNTP.

Otherwise, you can synchronize the time with the computer from which you are configuring Querx TH or set it manually.

1. Open the page *System / Time* in the configuration interface.
2. Select the appropriate time zone for your country from *Set time zone*.
3. Set daylight saving time options:
   a. If in your country daylight saving time is applied and time changeover happens at the last Sundays in March and October, check *Auto DST*.
   b. If DST is applied in your country, but time changeover does not happen at the last Sundays in March and October, do not set *Auto DST*. Instead, set *DST* manually when DST is in effect.

4. Click on *Save* to apply your changes.

Obtain date and time over network

Querx TH can automatically obtain date and time over the Net Time Protocol, if an NTP server is available.

1. Enter the IP address or the host name of an NTP server at *Set NTP*, for example *pool.ntp.org*.
2. Click *Sync NTP* to receive date and time over network.

Information

As long as a valid NTP server is available, Querx TH will automatically update date and time once an hour.

Set date and time manually

If you cannot receive date and time over network, you need to manually provide these values.

1. In the section *Set time* enter the current date in the little endian date format at the field *Date*. For the February 1st, 2014 this is *01.02.2014*.
2. Enter the current time in the field *Time*, with hours, minutes and seconds separated by colons. For half past 1 pm, this is *13:30:00.*
3. Click on *Save* to apply your changes.

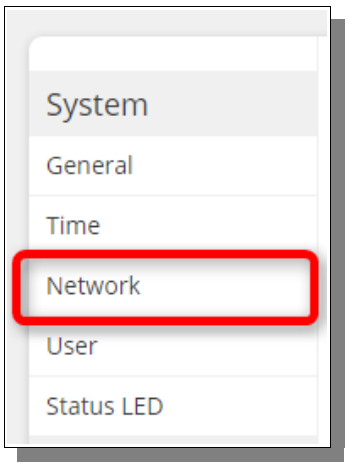
Synchronize date and time with your computer

You can also synchronize date and time with the computer you use to configure Querx TH.

1. In the section *Set time*, click on *Sync PC*. The time and date fields are updated.
2. After synchronization do not click on Save.

4.1.5 Deactivating the discovery function

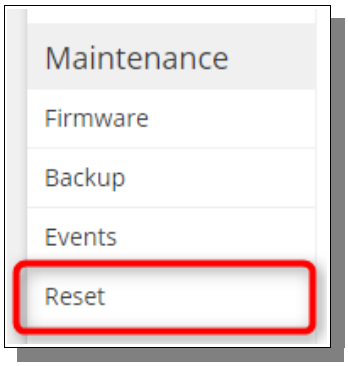
To enable network configuration with **Device Discoverer**, Querx TH has the discovery function enabled as default. To increase security, it is recommended to deactivate this function after your device is set up.



1. In the configuration interface, open the page *System / Network.*
2. Next to Discovery, deactivate the check box *Enable*.
3. Click on *Save* to apply your changes.

4.1.6 Reset internal memory

Once Querx TH is powered up, the device starts recording data. To restart the recording with the new settings, you need to reset the internal memory.



1. In the configuration interface, open the page *Maintenance / Reset*.
2. Click on the *Delete sensor data* button.
3. Confirm the reset by ticking the check box *Are you sure*.
4. Click on *Yes*.

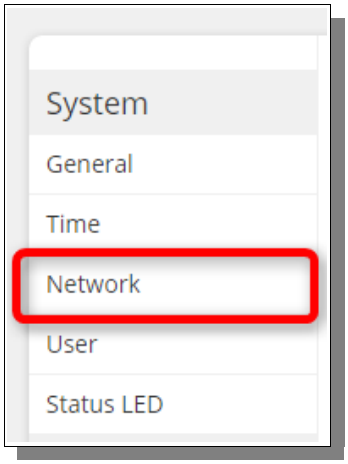
This process can take several seconds. Afterward Querx TH restarts recording data with timestamps and temperature units according to your configuration.

4.2 Network configuration

In most cases, Querx TH automatically gets a network configuration over DHCP. It is nevertheless possible to manually configure network settings.

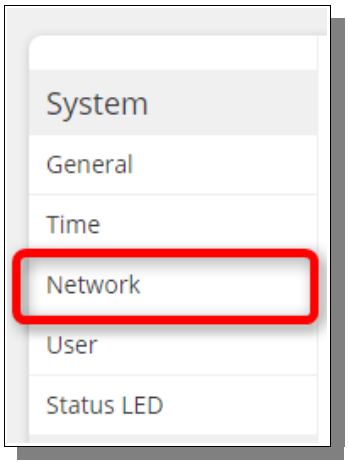
⚠	**Information** Some changes to the network configuration require a reboot of the system. See Section 6.1, 'Restart Querx TH'.

4.2.1 Automatic configuration over DHCP



1. In the configuration interface, open the page *System / Network.*
2. Choose *Obtain IP address automatically.*
   a. If you want to obtain DNS settings automatically as well, choose *Obtain DNS server* automatically.
   b. If you want to configure your own DNS servers, choose *Set DNS Server* manually and enter the IP addresses of your first name server in *Preferred DNS server* and of your second name server in *Alternate DNS server*.
3. Click on *Save* to apply your changes.
4. If you have changed your DNS setting, restart the device as discussed in Chapter 6.1.

4.2.2 Manual configuration



1. In the configuration interface, open the Page *System / Network*.
2. Click on *Set IP address manually.*
3. Enter the IP address for the device in the field *Local IP address*.
4. Specify a *Network mask*.
5. Provide the IP address of the router, which connects Querx TH to the Internet in *Gateway IP address.*
6. Provide a *Preferred DNS server* and an *Alternate DNS server* for Internet name resolution in the appropriate fields.
7. Click on *Save* to apply your changes.
8. Restart the device as discussed in chapter 6.1.

4.3 User Management

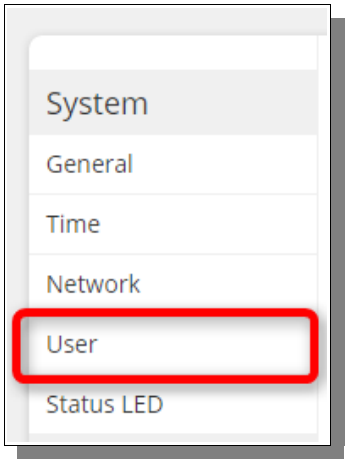
You can configure up to three users with varying access restrictions to the device. Per default, data access and

configuration are allowed for any user from the local network.

You can assign different right groups to system users:

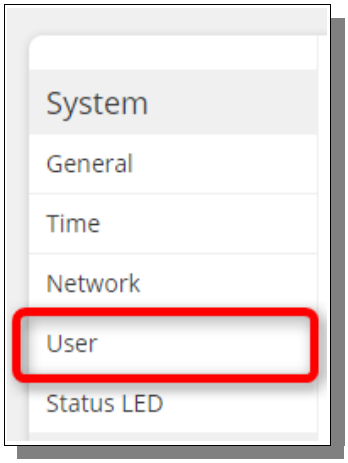
- *Disabled:* User has no access to the device.
- *Read data*: User can read measured data.
- *Read data / read config:* User can read measured data and device configuration.
- *Read data / write config:* User has unrestricted access to measurement data and to the device configuration.

4.3.1 Add user



1. In the configuration interface, open the Page *System / User*.
2. In the section *Users*, click on the action *Add* next to a free slot.
3. On the next page, provide a *User name* and a *Password* in the according fields.
4. Choose the access rights that you want to assign to the user from *Group*.
5. Click on *Save* to apply your changes.

4.3.2 Edit user

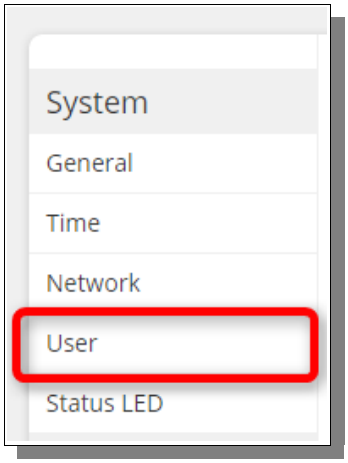


1. In the configuration interface, open the page *System / User*.
2. In the section *Users* click on *Edit* next to the user you want to change.
3. On the following page, carry out your changes.
4. Click on *Save* to apply your changes.

Information

You can only withdraw configuration write access from a user, as long as at least one other user with write access exists.

4.3.3 Delete user



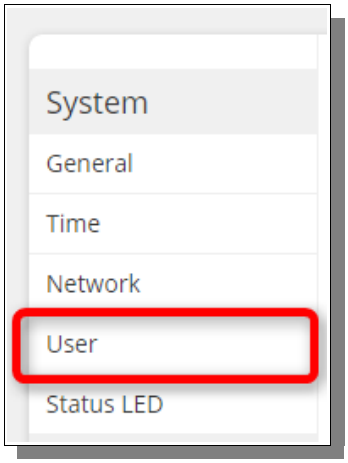
1. In the configuration interface, open the page *System / User*.
2. In the section *Users*, click on the action *Del* next to the user that you want to remove.
3. On the following page, confirm the removal by clicking on *Yes*.

Information

A user with write access on the configuration can only be deleted, as long, as at least one other user with write access exists.

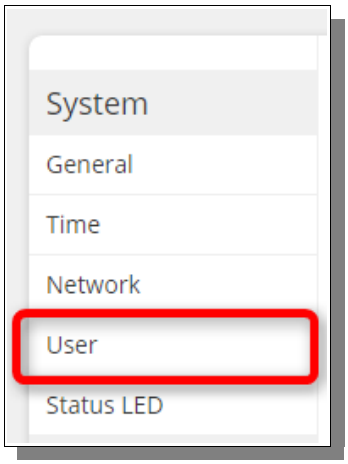
4.3.4 Deactivate anonymous access

As soon as you have added users with write access on the configuration, you can restrict the anonymous access.



1. In the configuration interface, open the page *System / User.*
2. In the section *Users* click on *Edit* next to the user *Anonymous*.
3. To completely deactivate anonymous access, choose *Disabled* from *Group*. To only restrict the access, choose the appropriate *Group*.
4. Click on *Save* to apply your changes.

4.3.5 Automatic log out



If a user does not perform any actions for a longer period, he will be automatically logged out. You can adjust this time.

1. In the configuration interface, open the page *System / User.*
2. In the section *Session* enter the number of seconds, after which a user is logged out at *Timeout*.
3. Click on *Save* to apply your changes.

4.4 Configuration of alerts

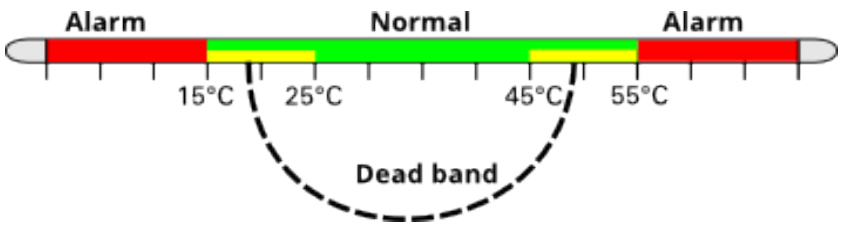
In chapter 4.1.2 'Configuration of the temperature probe', you have already started with the configuration of the temperature sensor. This part covers the configuration of sensor alerts.

4.4.1 Dead-band

To avoid repeated alerts, you can set a dead-band for alerts, which are triggered on exceeding a threshold.

This value specifies the number of units, that the measured value has to move back into the direction of the normal status, after a threshold was exceeded, before another alert is triggered.

Please refer to the following image:



This example shows an upper temperature limit of 55 °C and a lower temperature limit of 15 °C. The dead-band is set to 10.

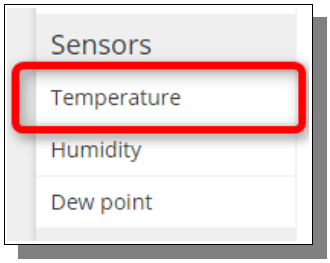
If an alert is triggered at 55 °C, the sensor has to measure 45 °C or less, before another alert is triggered on again exceeding 55 °C.

4.4.2 Temperature alerts

Querx TH supports for types of temperature alerts:

- Temperature too high
- Temperature too low
- Temperature rises too fast
- Temperature drops too fast

How Querx TH reacts upon occurring alerts is discussed in chapter 5 'Data access and configuration of interfaces'.



1. In the configuration interface, open the page *Sensors / Temperature.*
2. Optionally, enter a *Sensor name*, through which it can be identified in alert notifications.

Alert for exceeded thresholds

1. Set *Upper limit* to the value at which the maximum temperature is exceeded.
2. Set *Lower limit* to the value at which the minimum temperature is under-run.
3. Set *Alert delay* to the number of seconds, that a threshold needs to be exceeded, before an alert is triggered.
4. Set *Dead-band* to an appropriate value, for example 0.5.

Alert for temperature dropping too fast

1. Set *Drop value* to the number of units, that the measured value may drop within a defined period of time.

2. Set *Drop time* to the number of minutes, over which the change in temperature should not exceed the *Drop value*. You can deactivate this alert by entering *0*.

Alert for temperature rising too fast

1. Set *Rise value* to the number of units, that the measured value may rise within a defined time.
2. Set *Rise time* to the number of minutes, over which the change in temperature should not exceed the *Rise value*. You can deactivate this alert by entering *0*.

Save you alert settings

After having configured the alerts, don't forget to save your changes.

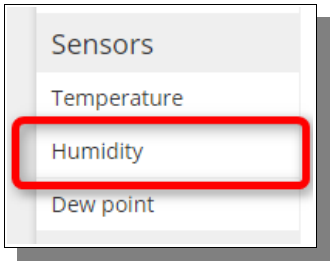
1. Click on *Save* to apply your changes.

4.4.3 Humidity alerts

Querx TH supports four types of humidity alerts:

- Humidity too high
- Humidity too low
- Humidity rises too fast
- Humidity drops too fast

How Querx TH reacts upon occurring alerts, is discussed in chapter 5 'Data access and configuration of interfaces'.



1. In the configuration interface, open the page *Sensors / Humidity.*
2. Optionally, enter a *Sensor name*, through which it can be identified in alert notifications.

Alert for exceeded thresholds

1. Set *Upper limit* to the value at which the maximum humidity is exceeded.
2. Set *Lower limit* to the value at which the minimum humidity is under-run.
3. Set *Alert delay* to the number of seconds, that a threshold needs to be exceeded, before an alert is triggered.
4. Set *Dead-band* to an appropriate value, for example 2.

Alert for humidity dropping too fast

1. Set *Drop value* to the number of units, that the measured value may drop within a defined period of time.
2. Set *Drop time* to the number of minutes, over which the change in humidity should not exceed the *Drop value*. You can deactivate this alert by entering *0*.

Alert for humidity rising too fast

1. Set *Rise value* to the number of units, that the measured value may rise within a defined period of time.
2. Set *Rise time* to the number of minutes, over which the change in humidity should not exceed the *Rise value*. You can deactivate this alert by entering *0*.

Save your alert settings

After having configured the alerts, don't forget to save your changes.

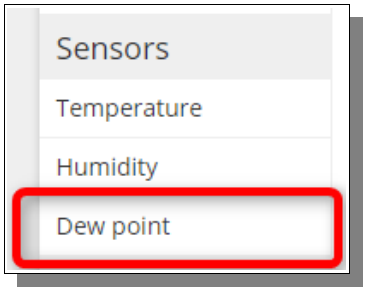
1. Click on *Save* to apply your changes.

4.4.4 Dew point alerts

Querx TH supports two types of dew point alerts:

- Dew point too high
- Dew point too low

How Querx TH reacts upon occurring alerts, will be discussed in chapter 5 'Data access and configuration of interfaces'.



1. In the configuration interface, open the page *Sensors / Dew point.*
2. Optionally, enter a *Sensor name*, through which it can be identified in alert notifications.

Alert for exceeded thresholds

1. Set *Upper limit* to the value at which the maximum dew point is exceeded.
2. Set *Lower limit* to the value at which the minimum dew point is under-run.

3. Set *Alert delay* to the number of seconds, that a threshold needs to be exceeded, before an alert is triggered.
4. Set *Dead-band* to an appropriate value, for example 0.5.

Save your alert settings

After having configured the alerts, don't forget to save your changes.

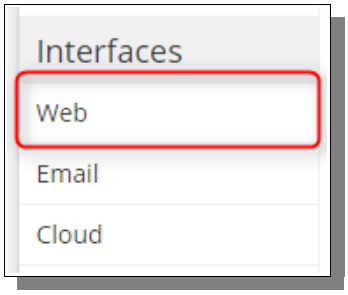
1. Click on *Save* to apply your changes.

5 Data access and configuration of interfaces

Querx TH provides several interfaces to make the measured data available over Ethernet and to send out notifications on occurring events.

5.1 Web interface

5.1.1 Configuration of the web interface



1. In the configuration interface, open the page *Interfaces / Web.*
2. In the section *Web interface*, select the period of time from *Refresh rate*, after which the dynamic information on the web pages, such as temperature, time or memory used, should be updated.
3. In the section *Chart*, choose the color for the temperature graph from *Temperature color*.
4. In the section *Chart*, choose the color for the humidity graph from Humidity *color*.
5. Click on *Save* to apply you changes.

5.1.2 Visualization of measured data

The chart on Querx TH's home page shows the development of values since the beginning of the recordings.

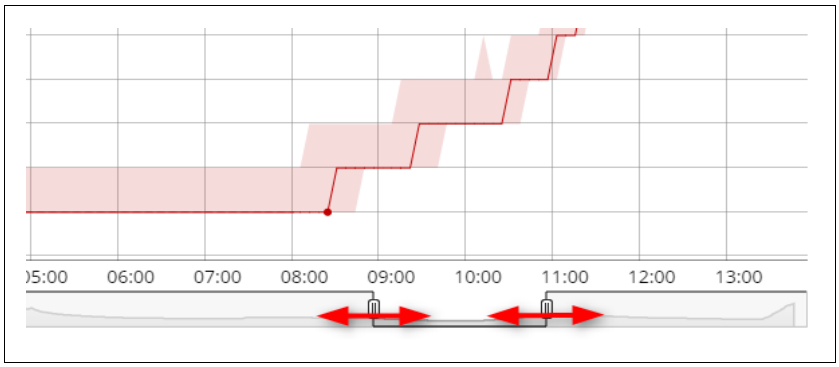
The full-colored lines (1) shows the progress of the mean value. The brighter areas (2) next to this line show the maximum and minimum values, which were measured in the displayed time frames.

The horizontal bars show the thresholds at which alerts are triggered, their height is specified by the Dead-bands. How to adjust this value is discussed in chapter 4.4 'Configuration of alerts'.

Adjust timescale

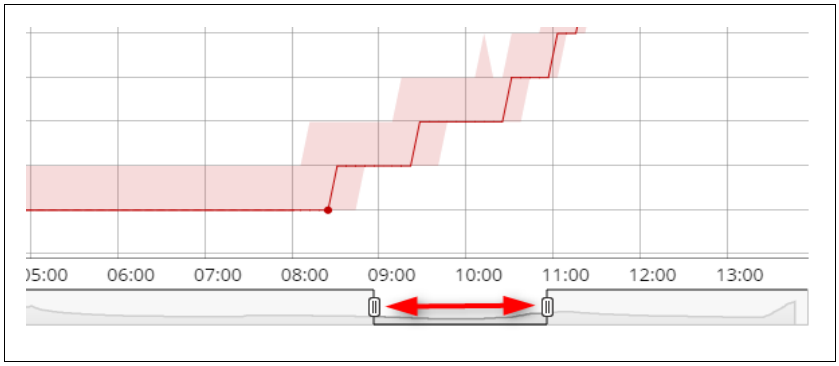
The gray bar underneath the chart shows the measurement period. You can use the two sliders, to scale the displayed time period.

If the sliders are set to the outer limits of the gray bar, the whole measurement period is displayed.



Move time period

If you have adjusted the period, you can move the area between the sliders to set the time segment, which you want to display.



5.1.3 Export recorded data

You can export the data, that Querx TH has recorded. The device supports exports in the CSV and XML file formats.

1. Open the homepage of Querx TH.
2. Adjust the time period for export, as discussed in the last part.
3. Click on *Export*.
4. Choose the *Format* in which you want to export the data.
5. At *Steps*, choose the time difference between two records.
6. Finally click on *Download*.

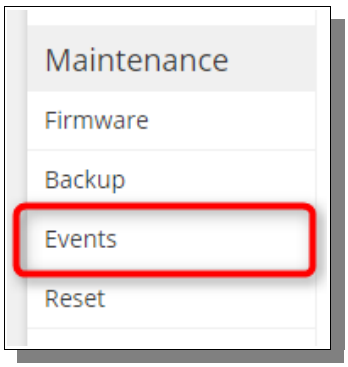
Each record contains date, the beginning time of the interval, minimum, maximum and calculated mean temperatures.

5.1.4 Embed chart into other web sites

Where Querx TH can be reached over network, you can embed the chart in to other web sites, for example in your intranet, using an Iframe.

1. Open the homepage of Querx TH.
2. Click on *Iframe.*
3. Copy the shown HTML code into the clipboard.
4. Paste the HTML-Code into the source code of the web site, into which you want to embed the chart.

5.1.5 Last sensor events



In the configuration interface, you can access the last 16 sensor events, like alerts, returns to the normal state or sensor failures.

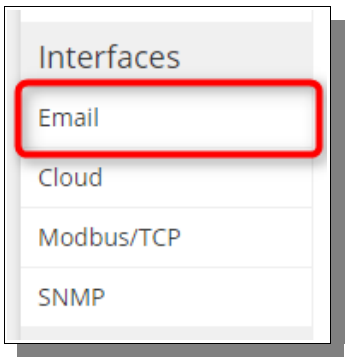
1. In the configuration interface, open the page *Maintenance / Events.*

5.2 E-Mail interface

Querx TH sends email notifications to up to 4 recipients over up to 2 email servers.

5.2.1 Manage email accounts

To enable sending emails, you need to provide at least one email account. You optionally can add a second email account as fallback.



1. In the configuration interface, open the page *Interfaces / Email.*
2. In the section *Email accounts*, click on the action *Add* next to one of the free slots.
3. On the next page, provide the sender's email address in the field *Sender*.
4. Enter the host name or IP address of the mail server in *SMTP server*.
5. Specify the SMTP port for your mail server at *Port*.
6. If you need to authenticate at your mail server, activate the check box *Authentication*.
7. Enter a *User name* and a *Password* in the appropriate fields.

Information

The log in data is written to the device without encryption. So do not use an email account over which confidential communication is carried out. If needed, create an own account for Querx TH.

8. Click on the *Test* button to check your settings. If everything is fine, the button will turn green. If you have made a mistake, the corresponding field will be highlighted with a red border. In this case, correct the errors and click on *Test* again.
9. Click on *Save* to apply your changes.

Edit email account

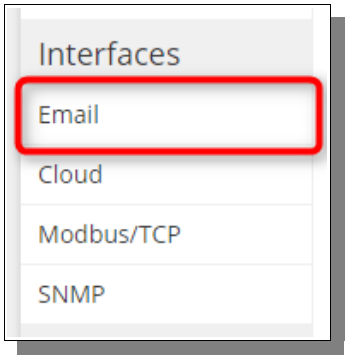
1. In the configuration interface, open the page *Interfaces / Email.*
2. In the section *Email accounts*, click on Edit next to the account, which you want to change.
3. On the following page, make your changes.
4. Click on the *Test* button to check your settings. If everything is fine, the button will turn green. If you have made a mistake, the corresponding field will be highlighted with a red border. In this case, change the field and click on *Test* again.
5. Click on *Save* to apply your changes.

Remove email account

1. In the configuration interface, open the page *Interfaces / Email.*
2. In the section *Email accounts* click on the action *Del* next to the account, which you want to remove.
3. Confirm the removal by clicking *Yes* on the following page.

5.2.2 Manage email recipients

Querx TH supports up to 4 email recipients, each of whom you can assign the mail server over which emails are sent. Also, you can choose the events on which notifications are sent for each recipient.



1. In the configuration interface open the page *Interfaces / Email.*
2. In the section *Recipients*, click on the action *Add* next to one of the free slots.
3. On the next page enter the email address for the recipient in the field *Email* and choose the account from which you want emails to be sent to this address.
   a. If you want to use a second mail server as fallback, choose both accounts.
   b. If you want to send emails over different mail servers, for example if internal emails are send over a local

server, only choose the mail server to send emails from.

4. At *Notify on*, choose the events for which you want to send notifications to this recipient.
5. Click on *Test*, to check the settings. Check your email afterward.
6. Click on *Save* to apply your changes.

Edit email recipient

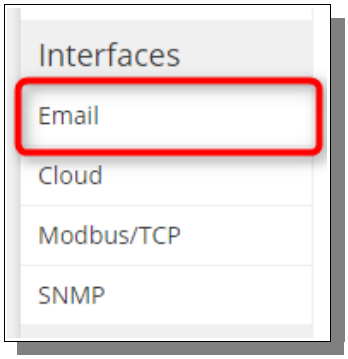
1. In the configuration interface, open the page *Interfaces / Email.*
2. In the section *Recipients*, click on the action *Edit* next to the recipient, which you want to change.
3. On the next page, make your changes.
4. Click on *Test*, to check the new settings.
5. Click on *Save* to apply your changes.

Delete email recipient

1. In the configuration interface, open the page *Interfaces / Email.*
2. In the section *Recipients* click on the action *Del* next to the recipient, which you want to remove.
3. Confirm the removal by clicking on *Yes* on the following page.

5.2.3 Email templates

Querx TH sends notifications when alerts occur or when the unit returns to the normal state. For both cases, you can define templates.



1. In the configuration interface, open the page *Interfaces / Email*.
2. In the section *Alert notifications*, enter an *Email subject* and an *Email body* for both templates.

   You can use following variables, that are dynamically substituted when sending out the notifications:

$S	Name of the sensor that has triggered the alert
$V	Measured value
$U	Physical unit of the measured value
$I	IP address of the device
$L	Location of the device
$N	Host name of the device
$C	Responsible member of staff

3. Click on *Save* to apply you changes.

5.3 Cloud services

Querx TH can export the measured data to the Internet-of-Things clouds Xively and ThingSpeak. This allows world wide data access and easy integration into own projects via Application Programming Interfaces.

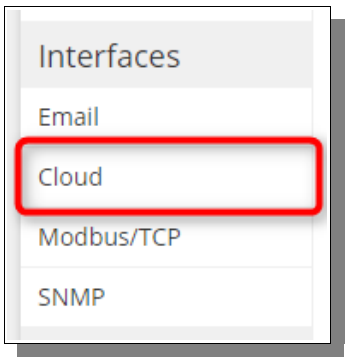
Cloud services are updated every full 10 minutes.

5.3.1 Data export to ThingSpeak

For the data export to ThingSpeak, you need to set up a ThinkSpeak channel. This can be done free of charge at the cloud provider's website: www.thingspeak.com.

To set up a cloud connection you will need the following data:

- The channel ID of your ThinkSpeak channel
- The field ID for temperature values
- The field ID for humidity values
- The write API key



1. In the configuration interface, open the page *Interfaces / Cloud*.
2. In the section *ThingSpeak*, enter your write API key in the field *API key*.
3. Enter your Channel number in the field *Channel number.*
4. Enter the ID for the temperature field in *Temperature Field ID*.
5. Enter the ID for the humidity field in *Humidity Field ID*.
6. Click on *Save* to apply your changes.

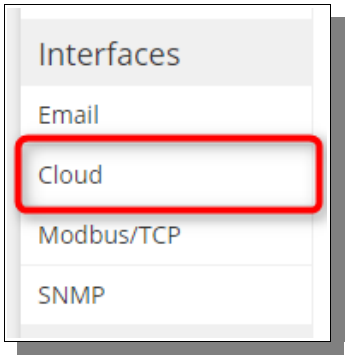
After saving your ThingSpeak configuration, you find a *Link* below. If you click on that link, your ThinkSpeak channel will be opened in a new browser window.

5.3.2 Data export to Xively

To connect Querx TH to Xively, you will need a Xively feed. You can set this up at the cloud provider's website: www.xively.com.

You will need the following data to connect Querx TH to Xively.

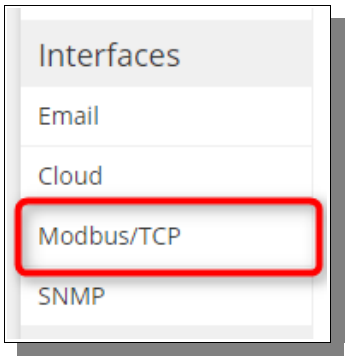
- The ID of the Xively feed for Querx TH to update
- The API key that allows Querx TH to write onto that feed



1. In the configuration interface, open the page *Interfaces / Cloud.*
2. In the section Xively, provide the *API key* for write access.
3. Enter the *Feed ID* for your Xively feed.
4. Click on *Save*, to apply your changes.

After saving the configuration, you will find a *Link* below. If you click on that link, your Xively feed will be opened in a new browser window.

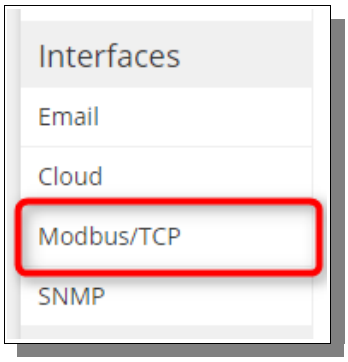
5.4 Modbus/TCP



Querx TH can send data via Modbus/TCP, for example if you want to employ the device in industrial applications (SCADA).

You can find a listing of all addressable registers in chapter 7.2 'Modbus registers'. Hands-on examples on how to use Querx and Modbus/TCP can be found on the product page at http://sensors.egnite.de.

5.4.1 Activate Modbus/TCP



1. In the configuration interface, open the page *Interfaces / Modbus.*
2. Tick the check box *Enable* to activate Modbus/TCP.
3. If you want to allow configuration changes via Modbus/TCP, uncheck the check box Write Protection.
4. Click on *Save* to apply your changes.

Information

Querx TH does not support concurrent Modbus/TCP connections. If you want several masters to connect to the device, you need to disconnect your connections frequently.

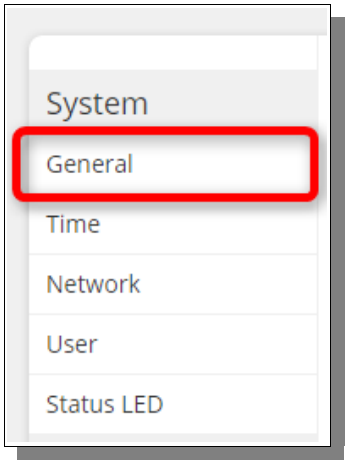
5.5 SNMP

The Simple Network Management Protocol SNMP allows to integrate Querx TH into network management systems, such as Nagios, OpenNMS or Zabbix.

You can find the important SNMP OIDs in chapter 7.3, 'SNMP object Identifiers'. The MIB can directly be downloaded from the device.

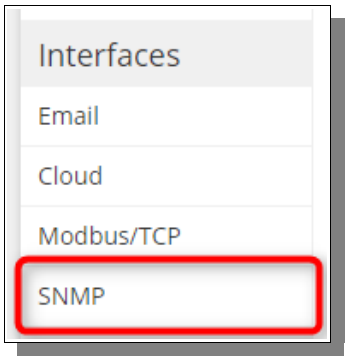
Some hands-on examples on how to use Querx TH with SNMP can be found on the product's website at http://sensors.egnite.de.

5.5.1 General settings



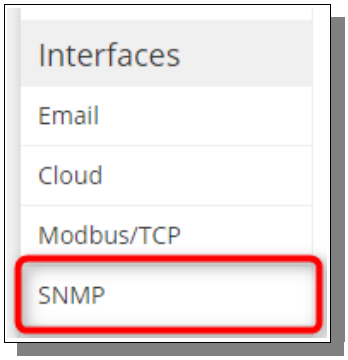
1. In the configuration interface, open the page *System / General.*
2. Enter a *System name* to identify the device over SNMP. Please keep in mind, that this name is also part of the host name, over which Querx TH can be addressed in the network.
3. In the field *Contact person* provide a responsible member of staff.
4. Enter a *System location* for Querx TH.
5. Click on *Save* to apply your changes.

5.5.2 Activate SNMP Agent



1. In the configuration interface, open the page *Interfaces / SNMP.*
2. In the section *SNMP agent*, tick the check box *Enable*, to active the SNMP agent.
3. Check the *Read community* and adjust it, if needed.
4. Click on *Save* to apply your changes.

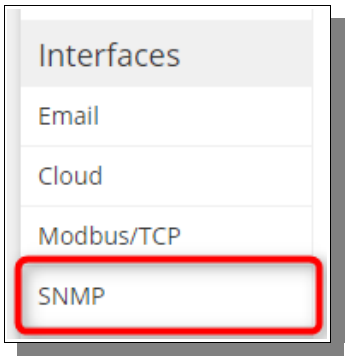
5.5.3 Activate SNMP traps



1. In the configuration interface, open the page *Interfaces / SNMP.*
2. In the section *SNMP traps*, provide the host that will receive traps sent by Querx TH at *Trap destination.*
3. Check the *Trap Community* and adjust it, if needed.
4. Select the events on which a SNMP trap should be send at *Send trap on.*

5. Click on *Save* to apply your changes.

5.5.4 Download MIB

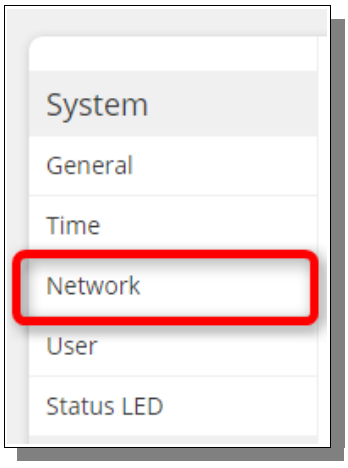


1. In the configuration interface, open the page *Interfaces / SNMP.*
2. In the section SNMP agent, click on *Download* next to *MIB.*

5.6 Syslog

Querx TH can send a multitude of logging-, error- and alert messages over the syslog protocol. If problems occur, this functionality helps you to spot their origin. Software to receive syslog messages can be downloaded from the Internet.

5.6.1 Configure syslog server



1. In the configuration interface, open the page *System / Network.*
2. Provide the IP address or the host name of your syslog server at *Syslog server.*
3. Click on *Save* to apply your changes.

5.7 Android App Querx Discoverer

You can find the App **Querx Discoverer** on Google Play: https://play.google.com/store. This App gathers measurement data over network and cloud services. The app can also be used to set up a basic network configuration.

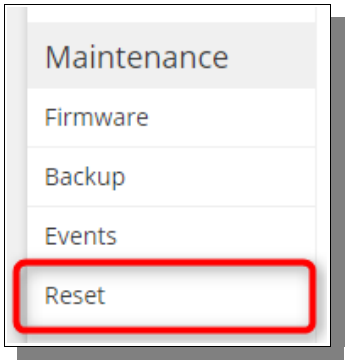
6 Maintenance, tips and troubleshooting

6.1 Restart Querx TH

There are two ways to restart Querx TH.

6.1.1 Warm reboot

After some configuration changes, a reboot of the system is required.



1. In the configuration interface, open the page *Maintenance / Reset*.
2. Click on the button *System reset*.
3. Confirm reboot by clicking *Yes on the next page.*

6.1.2 Cold reboot

If the device does not react any more, you can perform a cold reboot.

1. Disconnect the device from the power supply.
2. Wait for about 20 seconds.
3. Reconnect the device to the power supply.

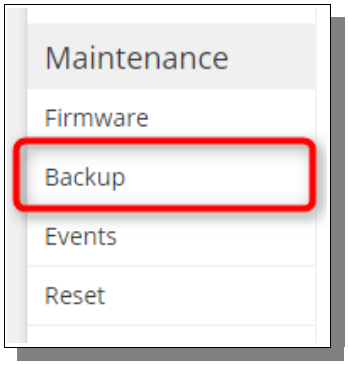
6.2 Configuration backup and restore

To backup your configuration or to reproduce the settings on different devices, you can export the configuration and save it.

Following settings are ignored:

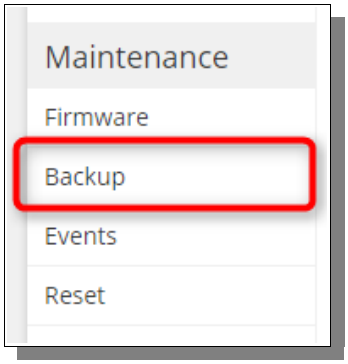
- Manual network settings
- Email accounts and passwords
- API keys for cloud providers

6.2.1 Backup configuration



1. In the configuration interface, open the page *Maintenance / Backup*.
2. In the section *Configuration backup* click on *Download* next to *Configuration*.
3. Save the file by clicking on *OK*.

6.2.2 Restore configuration

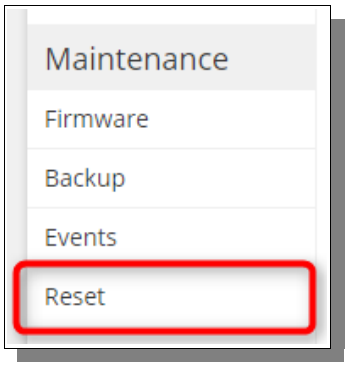


1. In the configuration interface, open the page *Maintenance / Backup*.
2. In the section *Configuration restore* click on *Choose File* next to *Upload*.
3. Choose the configuration backup that you want to restore.
4. Click on *Upload*.
5. Restart Querx TH, as discussed in chapter 6.1.
6. Finally set up clouds, email accounts and users.

6.3 Reset configuration

There are two ways to restore the factory defaults on the device.

6.3.1 Configuration reset via web interface



1. In the configuration interface, open the page *Maintenance / Reset*.
2. Click on *Configuration reset*.
3. Confirm the reset by clicking on *Yes* on the following page.

Configuration resets carried our via web interface will not reset the host name and the IP configuration.

6.3.2 Manual configuration reset

In case you cannot log in to Querx TH, for example if you have lost the log in data, you can do a manual reset to restore the factory defaults. For that you will need:

- A ballpoint pen

⚠	**Attention** Do not use a pencil for a manual reset, as its lead could break and damage the device.

1. With the device turned on, press the reset button using the ballpoint pen. This button is just underneath the opening next to the status LED.
   The status LED blinks red.
2. Hold the button until blinking stops. Querx TH is now rebooted with the factory defaults.

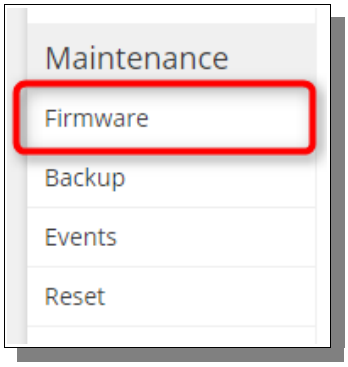
Manual hardware resets will also reset the device's host name and IP configuration to the factory defaults.

6.4 Firmware updates

To extend the functionality of Querx TH, egnite occasionally provides new firmware images. If needed, they can be installed on the device and afterward activated.

There are two slots to hold firmware images. If you activate one of those images, they are transferred into the internal memory and will be booted when the device is restarted.

6.4.1 Install firmware image



Install firmware image

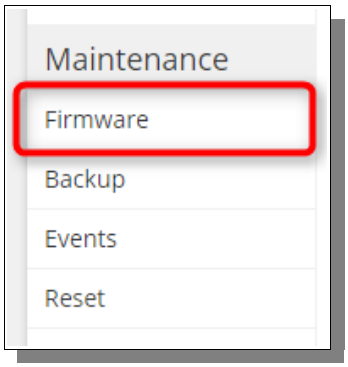
1. In the configuration interface, open the page *Maintenance / Firmware*.

   In the section *Version* you can see the currently running firmware version. If this version is lower than the version that you can find on http://sensors.egnite.de, a firmware update can be sensible.

1. Download the most recent firmware image from the http://sensors.egnite.de.
2. In the configuration interface, open the page *Maintenance / Firmware*.
3. Select the *Buffer*, in which you want to install the new firmware image in the section *Upload*. This should be the buffer with the lowest firmware version number or an empty buffer.
4. Click on *Choose file* and select the downloaded firmware image.
5. Afterward click on *Upload* to write the image into the selected buffer.

6.4.2 Activate firmware image

After you have uploaded a new firmware version, you need to activate it.



1. In the configuration interface, open the page *Maintenance / Firmware*.
2. In the section *Activation* choose the *Buffer* with the firmware image, which you want to activate.
3. Click on the button *Activate* to write the firmware image into the internal memory.

Afterward the device will reboot with the new firmware.

⚠	**Attention** Do not disconnect the device from the power supply while transferring the firmware into the internal memory. This could damage the device.

6.4.3 Activate alternative firmware image

If, after changing the active firmware, unexpected problems occur, you can manually activate the other firmware image on the device. To do that you will need:

- A ballpoint pen

⚠	**Attention** Do not use a pencil for a manual reset, as its lead could break and damage the device.

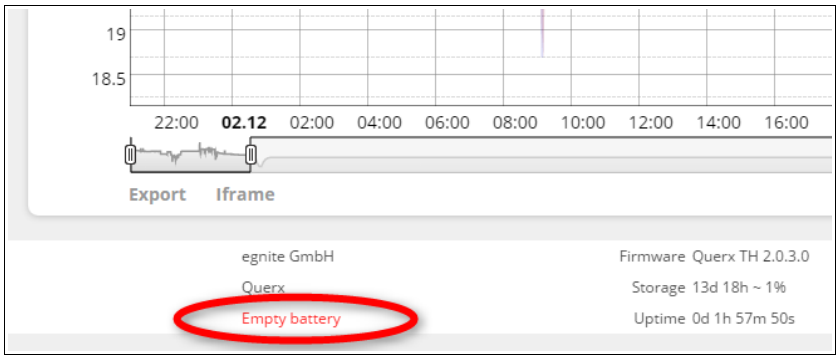
1. Disconnect the device from the power supply.
2. Press the reset button using the ballpoint pen. You find the button underneath the opening next to the status LED.
3. Hold the button while you reconnect Querx TH to the power supply. The device starts blinking. After a couple of seconds the blinking stops and status LED lights red.
4. Now release the button. The alternate firmware image is written into the internal memory and Querx TH reboots.

⚠	**Attention** After the activation, please wait until the device has rebooted before you disconnect it from the power supply. If disconnected during the transfer process, the device could be damaged.

6.5 Change the battery

To enable the internal clock to operate without power supply, Querx TH is equipped with a battery. If its charge has

reached a critical level, you will see a notification in the lower left corner of the web interface.



Information

Querx TH is operational without battery. In operation and under usual environmental conditions (temperature at about 23°C), you will not have to change the battery.
If you disconnect the unit from the power supply, for example for storing, you need change the battery once every 5 years.

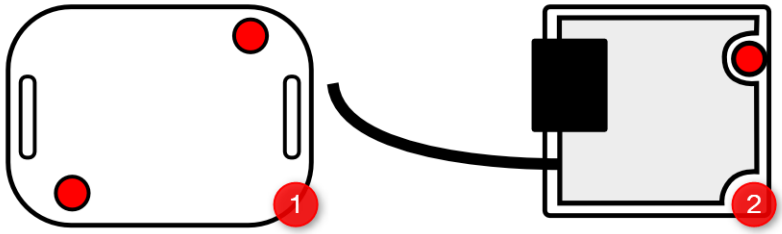
To change the battery you need

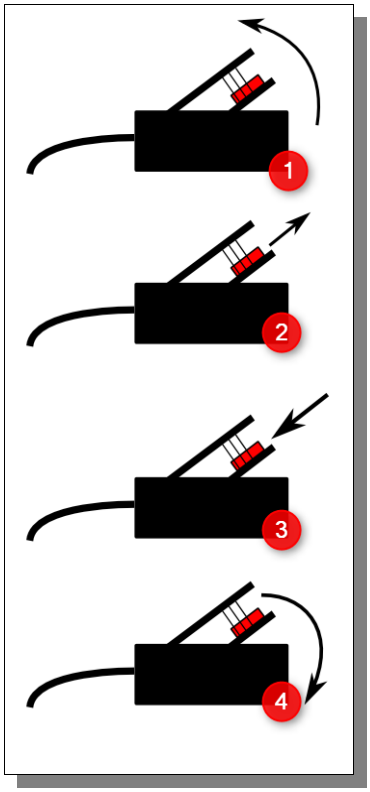
- a small Phillips screw driver
- a battery, type: Renata CR1225

Attention

Please avoid getting in touch with any contacts when changing the battery. The device could suffer from damages caused by electrostatic discharge.

First, open the enclosing:





1. Loosen both screws at the bottom side of the unit, marked red in the image above.
2. Inside the device is another screw that you need to loosen. This is also marked red in the image above.

Now, change the battery.

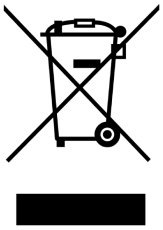
1. Carefully lift the board at the side opposing the sensor cable.
2. Use the screw driver to push the old battery out of its socket from behind.
3. Insert the new battery into the socket. If needed, gently push it with the screw driver.
4. Place the board back into the enclosing.
5. Now tighten the screw in the enclosing, as well as both screws at the bottom side of device.

6.6 Troubleshooting

Problem	Action to take	Chapter
No network connection	Perform a manual network configuration.	2.5
	Check if there are problems with your network. Maybe ask your network administrator	
Querx TH reacts very slow	In the configuration interface, open the page. *Maintenance / Firmware* If the value for *Memory usage* is bigger than 70%, close some browser windows showing Querx TH's web interface.	
Log in data unknown	Reset system configuration.	6.2
Unknown network configuration	Perform a manual network configuration	2.5
	Or: Reset the system configuration	6.2
NTP / Email / Cloud do not work	Check if you have provided a valid DNS server. Reboot system afterward.	4.2
II need to log in every couple of seconds	Increase the value for a *Session timeout*.	4.3
After a firmware update Querx TH doesn't work as expected	If there is another firmware image available on the system, reactivate it.	6.4

If you have questions that are not discussed in this manual, please don't hesitate to get in touch with the manufacturer egnite. You can find contact information in chapter 7.5 'Manufacturer and contact'

6.7 Environment-friendly disposal

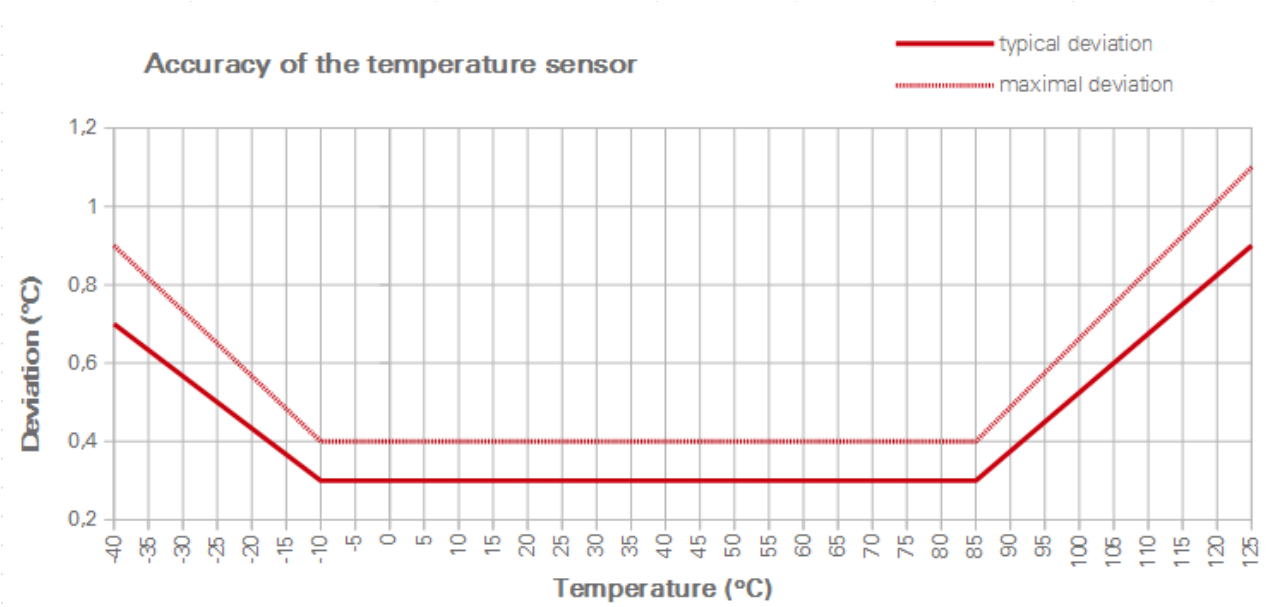


Please dispose Querx TH according to the legislation in you country and with the environment in mind.
The device contains electronic components and a battery and you must not be disposed with household waste.
Please hand in the device at the disposal center.

7 Appendix

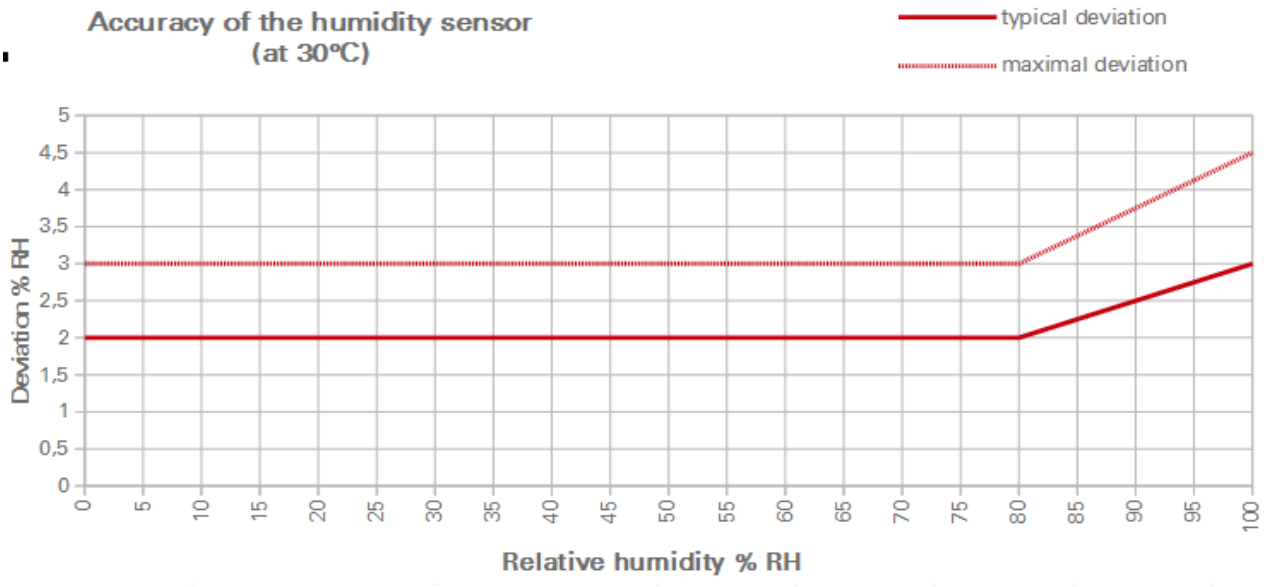
7.1 Temperature sensor

	Measurement range	Typical	Maximal	Unit
Deviation	-10 °C – 85 °C	± 0.3	± 0.4	°C
	-40 °C – 100 °C	See image		°C
Long term stability		≤ 0.01 °C		°C / year


Accuracy of the temperature sensor
typical deviation
maximal deviation
Deviation (°C)
1,2
1
0,8
0,6
0,4
0,2
-40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125
Temperature (°C)

7.2 Humidity sensor

	Measurement range	Typical	Maximal	Unit
Deviation	0 % – 80 %	± 2	± 3	%
	80 % – 100 %	See image		%
Long term stability		≤ 0.25		% / year



7.2.1 Error of measurement after exposure to extreme circumstances

If the sensors are exposed to extreme environmental conditions like very high temperature, drought or moistness, the sensing film can get to dry or to wet. This leads to a temporary decrease of accuracy for the humidity senor and the calculated dew point.

7.2.2 Recalibration of sensors

The sensors are calibrated by factory and do not need to be manually recalibrated. Recalibration can be carried out by egnite.

7.3 Technical data

Specifications	
Measuring range temperature	40 °C to 85 °C -40 °F to 185 °F
Accuracy	±0.3 °C from -10 °C to 85 °C / ±1.0 °C from -40 °C to -10 °C ±0.5 °F from 14 °F to 185 °F / ±1.8 °F from -40 °F to 14 °F
Resolution temperature	0.1 °C 0.2 °F
Measuring range humidity	0 % bis 95 % RH
Accuracy humidity	±2 % RH from 0 % to 80 % RH at 30 °C (86 °F) ±4,0 % RH from 80 % to 95 % RH at 30 °C (86 °F)
Resolution humidity	1 % RH
Humidity sensor	CMOS IC with polymide film
Calibration	By factory
Sensor heating	Integrated
Ethernet	10/100 Mbit RJ45, HP Auto-MDIX
Operating System	Nut/OS 5
Firmware updates	Via web interface, rescue function
Data capacity	At least 51 days internal
Protocols	DHCP, HTTP, mDNS, Modbus/TCP, SMTP, SNMP, SNTP, Syslog
Web interface	Password protection, diagram, live update, HTML5, CSS3, JSON and SVG, User Management (3 Users / 3 Groups)
Email	Up to 4 recipients over 2 SMTP accounts
Status LED	Red, green, yellow
Date / Time	Battery backed real-time clock with SNTP update
Power supply	5 VDC via Micro-USB
Consumption	Typical 120 mA, 0.6W Maximal 200 mA, 1W

Environment	
Operating conditions	-40 °C to 85 °C, max. 95 % RH -40 °F to 185 °F, max. 95 % RH
Storage conditions	--40 °C to 85 °C, max. 95 % RH -40 °F to 185 °F, max. 95 % RH
Mechanical data	
Housing material	ABS Thermoplastic
Housing color	Black, RAL 9011
Housing dimensions	56,3 mm x 40 mm x 21 mm plus sensing cable 2.2 in x 1.6 in x 0.8 in plus sensing cable
Weight	35 g 0.07 lb
Connectors	RJ45 (Ethernet), micro-USB
Mounting	Wall mounting
Certificates	
Immunity	EN 61326-1:2013 Class A EN 61000-4-2:2009 EN 61000-4-3:2011 EN 61000-4-4:2013 EN 61000-4-6:2009 EN 61000-4-8:2010
Emissions	EN 61326-1:2013 Class B EN 55011:2011
Housing / PCB flammability	UL94V-0
Protection marking	IP20
RoHS compliance	EU Directive 2011/65/EU

We reserve the right of error and technical modifications.

A EC declaration of conformity can be obtained from the manufacturer.

7.4 Modbus Registers

Read Registers			
Address	**Offset**	**Format**	**Content**
30011	10	int16	Temperature Celsius * 10
30012	11	int16	Relative humidity %
30013	12	int16	Temperature Fahrenheit * 10
30014	13	int16	Temperature Kelvin * 10
30015	14	int16	Dew point Celsius * 10
30016	15	int16	Dew point Fahrenheit * 10
30017	16	int16	Dew point Kelvin * 10

Holding Registers			
Address	**Offset**	**Format**	**Content**
40021	20	int16	Lower limit temperature in Celsius * 10
40022	21	int16	Upper limit temperature in Celsius * 10
40023	22	int16	Dead-band temperature in Kelvin / Celsius * 10
40024	23	int16	Lower limit temperature in Fahrenheit * 10
40025	24	int16	Upper limit temperature in Fahrenheit * 10
40026	25	int16	Dead-band temperature in Fahrenheit * 10
40027	26	int16	Lower limit temperature in Kelvin * 10
40028	27	int16	Upper limit temperature in Kelvin * 10
40031	30	int16	Lower limit humidity in %
40032	31	int16	Upper limit humidity in %
40033	32	int16	Dead-band for humidity

7.5 SNMP Object Identifiers

OID	Description
1.3.6.1.4.1.3444.1.14.1.2.1.5.1	Temperature sensor
1.3.6.1.4.1.3444.1.14.1.2.1.5.2	Humidity sensor
1.3.6.1.4.1.3444.1.14.1.2.1.5.3	Calculated dew point
1.3.6.1.4.1.3444.1.14.2.0.101	Trap code for normal state
1.3.6.1.4.1.3444.1.14.2.0.102	Trap code for alarm state
The complete MIB is on the device and can be downloaded from the *Interfaces / SNMP* page in the configuration interface.	

7.6 Export data formats

Querx TH supports data exports in two file formats:

- CSV

  Data exported in the CSV file format can be opened with any spreadsheet software.

- XML

  Data exported in the XML file format can be transferred to and processed by several applications.

7.7 Manufacturer and contact

egnite GmbH

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44575 Castrop-Rauxel
Germany

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Tel.: +49 (0)2305 441256
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http://sensors.egnite.de

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Revision 2.1

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